

# TransWest Express Transmission Project

## Draft

# Environmental Impact Statement

## (Volume I)



Wyoming State Office

June 2013



### **Mission Statement**

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

### **Mission Statement**

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states. Western's mission: Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services.



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
Wyoming State Office

and



United States Department of Energy  
WESTERN AREA POWER ADMINISTRATION

In Reply Refer To:

WYW-177893

COC-72929

UTU-87238

NVN-86732

DOE/EIS-0450

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statement (EIS) for the proposed TransWest Express Transmission Project (Project) and accompanying land use plan amendments for affected Bureau of Land Management (BLM) areas and National Forest units. TransWest Express LLC (Applicant) submitted applications for right-of-way (ROW) grants and special use permits to use portions of the National System of Public Lands in southern Wyoming, northwestern Colorado, across Utah, and into southern Nevada. The Applicant also has submitted a statement of interest and entered into a pre-development agreement with the Western Area Power Administration (Western) to potentially obtain financing for the Project from the borrowing authority granted to Western under the American Recovery and Reinvestment Act of 2009 (Recovery Act) (Public Law 111-5). The Applicant-proposed transmission line route and route alternatives cross public lands administered by 14 BLM Field Offices and five national forests over four states. The BLM Wyoming State Office and Western have been designated as joint lead Federal agencies for the National Environmental Policy Act of 1969 (NEPA) process, and are mutually overseeing the preparation of the EIS.

This Draft EIS was prepared in consultation with over 50 cooperating agencies and in accordance with the NEPA, as amended; and Council on Environmental Quality, Department of the Interior, Department of Energy, and Department of Agriculture regulations for implementing NEPA outlined in 40 Code of Federal Regulations (CFR) Parts 1500-1508, 43 CFR Part 46, 10 CFR 1021, and 36 CFR 220, respectively. Accompanying land use plan amendments were prepared for areas not consistent with the administering agency plan pursuant to the Federal Land Policy and Management Act of 1976, the National Forest Management Act of 1976, and the BLM and United States (U.S.) Forest Service (USFS) land use planning regulations at 43 CFR 1610.5 and 36 CFR 219.10.

The Draft EIS analyzes the consequences of the agencies' decisions on granting a BLM ROW and USFS special use permits to construct and operate a high voltage, direct current (DC) transmission system. Western and the Applicant are engaged in pre-development activities that precede Western's and the Department of Energy's decision whether to provide funding for a Recovery Act project. The Draft EIS also informs Western's decision on whether to use its borrowing authority to partially finance and hold partial ownership with TransWest in the resulting transmission facilities and capacity. The Project would provide the transmission infrastructure and capacity to deliver approximately 3,000 megawatts of electric power from renewable and other energy sources in south-central Wyoming to a substation hub in southern Nevada. The Applicant-proposed project would consist of an approximately 725-mile-long

600-kilovolt, high voltage DC transmission line and two terminals, each containing an alternating current/direct current (AC/DC) converter station. The northern AC/DC converter station would be located near Sinclair, Wyoming, and the southern AC/DC converter station would be located near the Marketplace Hub – a group of substations approximately 25 miles south of Las Vegas, Nevada. A ground electrode system (required for transmission line emergency shutdown) would be installed within 100 miles of each terminal. The Project would retain an option for future interconnection with the Intermountain Power Project transmission system in Millard County, Utah.

Alternatives to the proposed project were developed in response to issues raised during the NEPA scoping period. The Project has been divided geographically into four regions for analysis based on common locations where project alternative routes converge and can be combined with other alternative routes in the region. Each region contains an Applicant-proposed route and two to five alternative routes that are analyzed in this EIS, as well as the No Action Alternative. The BLM, through consultation with other Federal, State, and local cooperating agencies, has identified an agency preferred alternative within each of the four Project regions that would all combine to create a continuous route from Wyoming to Nevada, totaling approximately 760 miles. The BLM and USFS have identified plan amendments for each of the land use plans that would require modifications if the proposed or an alternative route is selected.

The Draft EIS and accompanying plan amendments are not decision documents. Their purpose is to inform the public and interested parties of the relative impacts of the proposed action and alternatives, and to solicit comments from other agencies and the public. The Draft EIS also provides information to other regulatory agencies for use in their decision-making process for permits required to proceed with the Project.

The BLM and Western will host public meetings to discuss the Draft EIS. Dates, times, and locations of these meetings will be distributed in newsletters, announced in the local news media, and posted on the Project website at <http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/transwest.html>.

The BLM and Western invite public comment on the Draft EIS, the Agency Preferred Alternative, and accompanying plan amendments. Your review and comment on the content of this document are critical to the project analysis and associated plan amendments. Comments should be as specific as possible. Please include suggested changes and sources or methodologies if applicable, and references to relevant section, page, and volume numbers of the document. Responses to substantive comments (further defined in 40 CFR 1503.3 and in Section 6.9.2.1 of BLM Handbook H-1790-1) will be included in the Final EIS.

The publication of the Notice of Availability in the *Federal Register* by the U.S. Environmental Protection Agency begins the 90-day comment period. Written comments will be accepted by fax, email, or letter. Please refer to “TransWest Transmission Project Comments” in your correspondence. Please provide your comments to:

Bureau of Land Management, Wyoming State Office  
Attn: Sharon Knowlton, TWE Project Manager  
P.O. Box 20678  
Cheyenne, Wyoming 82003  
E-mail: [TransWest\\_WYMail@blm.gov](mailto:TransWest_WYMail@blm.gov)  
(307) 775-6124  
Fax: (307) 775-6203

The Draft EIS is available for review during normal business hours at the following locations or at the following website: <http://www.blm.gov/wy/st/en/info/NEPA/document/hdd/transwest.html>:

BLM Wyoming State Office  
BLM Rawlins Field Office  
BLM Rock Springs Field Office  
BLM Little Snake Field Office  
BLM White River Field Office  
BLM Grand Junction Office  
BLM Cedar City Field Office  
BLM Fillmore Field Office  
BLM Moab Field Office

BLM Price Field Office  
BLM Richfield Field Office  
BLM St. George Field Office  
BLM Vernal Field Office  
BLM Egan Field Office  
BLM Caliente Field Office  
BLM Las Vegas Field Office  
USFS Dixie National Forest

Before including your address, phone number, email address, or other personal identifying information in your comment, be aware that your entire comment – including your personal identifying information – may be made publicly available. While you may ask us to withhold your personal identifying information from public release, we cannot guarantee that we will be able to do so. BLM and Western will not consider anonymous comments. Comments, including names and street addresses of respondents (unless otherwise withheld), will be available for public review at the BLM Wyoming State Office from 7:45 a.m. to 4:30 p.m. Monday through Friday, excluding federal holidays. Comments may be published as part of the NEPA document and other related documents. All submissions from organizations or businesses will be made available for public inspection in their entirety.

Thank you for your interest and participation in this NEPA process.

Sincerely,



Donald A. Simpson  
State Director, BLM Wyoming



Mark A. Gabriel  
Administrator, Western Area Power Administration

Enclosures – As Stated

## Executive Summary

This Executive Summary is intended to provide a brief overview of the proposed Project, alternatives, and conclusions from the impact analyses. For the supporting documentation and detailed analyses please see the full environmental impact statement (EIS).

### ES.1 Project Overview

The TransWest Express Transmission Project (Project) is proposed as an extra high voltage, direct current (DC) transmission system extending from south-central Wyoming to southern Nevada (**Figure ES-1**). The proposed transmission line (and alternatives) cross four states (Wyoming, Colorado, Utah, and Nevada) encompassing lands owned or administered by the Bureau of Land Management (BLM), United States (U.S.) Forest Service (USFS), National Park Service (NPS), Bureau of Reclamation, Utah Reclamation Mitigation and Conservation Commission, various state agencies, Native American tribes, municipalities, and private parties. The Project would provide the transmission infrastructure and capacity necessary to deliver approximately 3,000 megawatts (MW) of electric power from renewable and/or other non-renewable energy resources in south-central Wyoming to southern Nevada. One MW (or 1 million watts) of power can deliver approximately 6.5 million kilowatt-hours (kWh) of electricity in 1 year. An average U.S. household consumes about 10,655 kWh of electricity in a year. Therefore, 1 MW of power provides electricity for 610 households' annual use (American Wind Energy Association 2008). The Project would transmit power for over 1,800,000 households annually.

In April 2010, TransWest Express LLC (TransWest/Applicant) and Western Area Power Administration (Western), an agency of the U.S. Department of Energy, entered into a Memorandum of Understanding (MOU) in which Western agreed to act as joint lead agency with the BLM in the preparation of the EIS in accordance with the National Environmental Policy Act of 1969, as amended (NEPA).

#### ES.1.1 BLM and Western's Purpose and Need

The purpose of the BLM's federal action is to respond to TransWest's application for a right-of-way (ROW) to construct, operate, maintain, and decommission a transmission line on public lands. The need for this action is to fulfill BLM's responsibility under the Federal Land Policy and Management Act of 1976 and BLM ROW regulations to manage the public lands for multiple uses, including transmission of electric energy (43 Code of Federal Regulations 2806).

Western's purpose and need is to carry out Federal policy to facilitate renewable energy development and transmission expansion as established by the American Recovery and Reinvestment Act's 2009 amendment of the Hoover Power Plant Act of 1984 (Public Law 98-381, Title III, § 301) (Hoover Act). The Hoover Act provides Western the authority to borrow funds from the U.S. Treasury to construct, finance, facilitate, plan, operate, maintain, and/or study construction of new or upgraded electric power transmission lines and related facilities within Western's marketing area and which would deliver or facilitate the delivery of power from renewable resources.

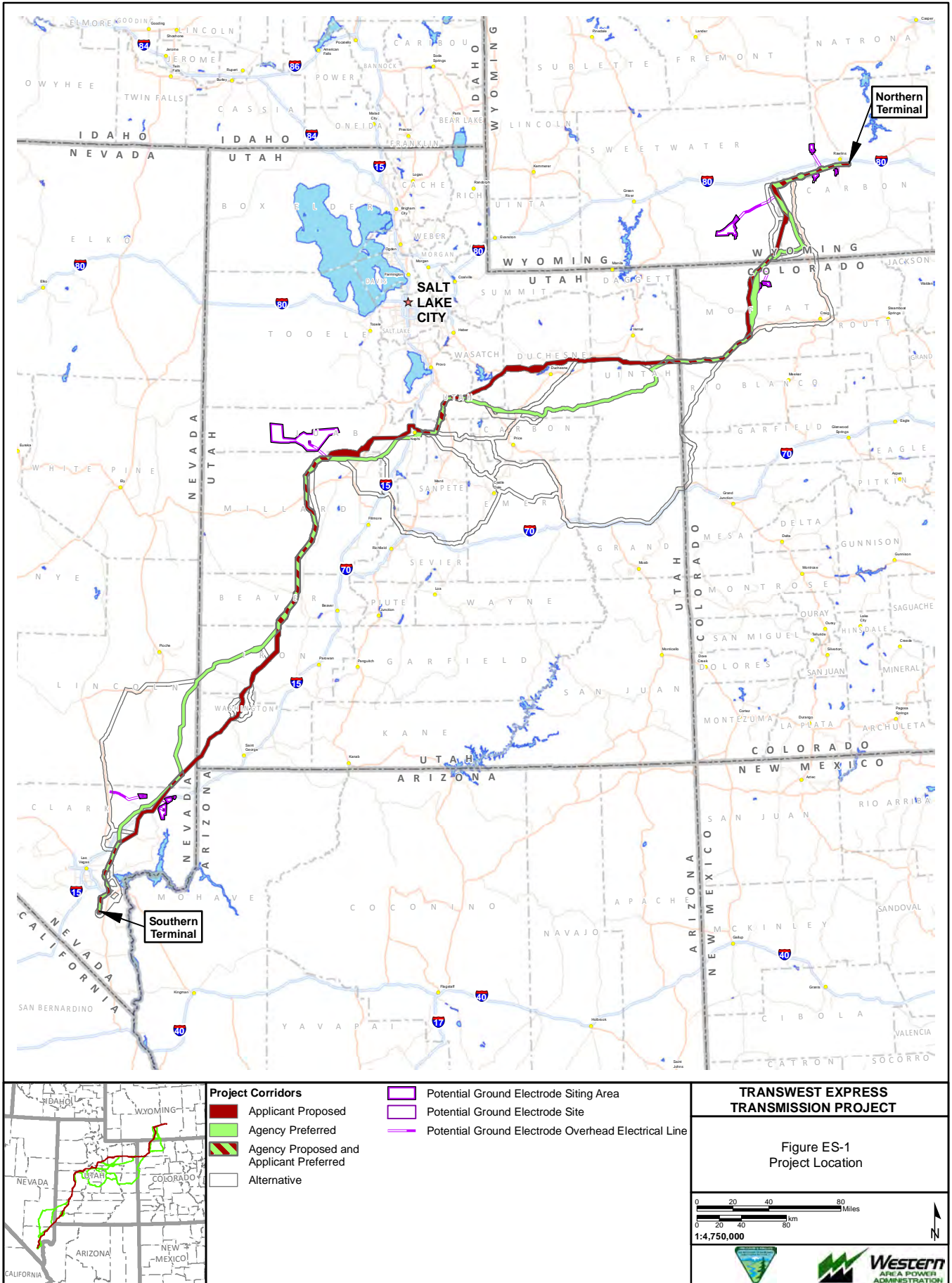
#### ES.1.2 Decisions to Be Made

BLM decisions to be made are to:

- Decide whether to grant, grant with modification, or deny a ROW to construct, operate, and maintain the proposed facilities for a transmission line on public lands;
- Decide whether one or more BLM land use plans should be amended to allow the proposed transmission line;



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- Determine the most appropriate location for the transmission line on public lands, considering multiple-use objectives; and
- Determine the terms and conditions (stipulations) for the construction, operation, maintenance, and decommissioning of the transmission line on public lands that should be applied to the ROW grant.

Western's decision is whether it would use its borrowing authority to partially finance and hold partial ownership with TransWest in the resulting transmission facilities and capacity.

The BLM and Western have prepared this EIS to disclose and analyze the potential direct, indirect, and cumulative impacts of the proposed action and alternatives, as required by NEPA, to facilitate public participation, and to assist the BLM and Western decision-makers in making the decisions listed above. The NEPA analysis includes disclosure of applicant-committed design features and proposed mitigation to reduce resource impacts.

Depending on the chosen alternative, this Project potentially would cross other federal lands. Accordingly, Project implementation would require other federal agencies to make decisions related to granting ROWs. The BLM has included those agencies, as well as non-federal agencies and/or municipalities with jurisdictional authority or special expertise with respect to resource issues addressed by the NEPA analysis as cooperating agencies in this EIS process. Over 50 agencies are participating in the process, including 9 federal agencies, 4 states, 24 counties, 6 conservation districts, and 1 grazing board that have signed MOUs as cooperating agencies for the Project.

### **ES.1.3 TransWest's Goals and Objectives for the Proposed Project**

TransWest's primary goal is to provide the transmission infrastructure and capacity necessary to reliably and cost-effectively transmit up to 3,000 MW of electric power from Wyoming to the desert southwest. TransWest would work within the following Project-specific objectives:

- Provide for efficient, cost-effective, and economically feasible transmission of approximately 20,000 gigawatt hours per year of clean and sustainable electric energy from Wyoming to markets in the desert southwest region;
- Meet North American Electric Reliability Corporation Reliability Standards and Western Electricity Coordinating Council planning criteria and line separation requirements;
- Maximize use of existing and designated utility corridors and access roads to the extent practical;
- Provide these benefits in a timely manner to the desert southwest region and the broader Western U.S. to meet the region's pressing environmental and energy needs. TransWest has identified a need for the Project by the expected in-service date of 2015 or as soon as the regulatory reviews can be completed; and
- Provide for flexibility and maximize the use of infrastructure to increase future transmission capacity by configuring the Project to allow for future interconnection with the Intermountain Power Project (IPP) transmission system near Delta, Utah.

### **ES.1.4 Conformance with Existing Plans and Regulations**

Actions that result in a change in the scope of resource uses, terms, conditions, and decisions of federal agency land use plans, including the approval of this proposal, may require amendment of one or more of the plans.

The BLM, Western, and cooperating agencies worked together to develop routes that would conform to existing federal land use plans. However, this objective was not reached for a number of the alternative routes analyzed in the Draft EIS. Plan amendments that would be necessary to implement each of the evaluated alternatives were identified by affected agencies and analyzed in Chapter 4.0 of the Draft EIS. The specific



land use plan amendments that are needed will depend upon which route is selected in the agencies' Records of Decision (RODs). In the Final EIS, the BLM will identify the agency preferred alternative and the requisite proposed plan amendments necessary to implement that alternative.

Each of the proposed BLM plan amendments would: 1) expand an existing utility corridor; 2) create a new utility corridor while allowing for exceptions to other resource stipulations if avoidance measures or impact minimization are not feasible within the designated corridor; or 3) create a one-time exception through a ROW exclusion area. Depending on the route alternative, potential plan amendments include the following:

- Region I. One or two plan amendments would be required. The BLM Rawlins (Wyoming) and Little Snake (Colorado) Field Offices (FOs) plans may be affected.
- Region II. One or up to four plan amendments would be required. The BLM White River (Colorado), Vernal, Price, and Salt Lake (Utah) FOs, and the Fishlake National Forest (Utah) plans may be affected.
- Region III. None or one plan amendment would be required. The BLM Caliente (Nevada) FO plan may be affected.
- Region IV. None or one plan amendment would be required. The BLM Las Vegas (Nevada) FO plan may be affected.

Other BLM or USFS management plans could be amended depending upon the specifics of the route that is selected in the ROD. Proposed amendments to plans that potentially are affected by the various alternatives are identified and analyzed in the Draft EIS.

Chapter 4.0 describes the proposed plan amendments required under each alternative, followed by an analysis of the environmental impacts and planning implications associated with adoption of these amendments. **Table A-1 in Appendix A** provides a list of the major federal, state, and local permits and approvals that could be required for construction, operation, and maintenance of the Project.

### **ES.1.5 Agency and Public Participation**

BLM and Western conducted pre-scoping activities in 2009 and 2010 with the BLM FOs, USFS, and the cooperating agencies. Comments received during pre-scoping were considered in developing the alternative corridors presented to the public during the scoping period. The Notice of Intent for the Project was published in the Federal Register on January 4, 2011, and a Project newsletter was concurrently mailed to approximately 23,000 interested parties. The BLM and Western held 23 public scoping meetings throughout the Project area. The meetings were advertised through display advertisements in local newspapers and public service announcements were submitted for broadcast on local media. The BLM and Western received a total of 622 scoping comment submittals. Through the scoping process, the following concerns were expressed:

- Corridor alternatives, as related to avoidance of sensitive resources, including special status species habitat, impacts to visual resources, areas with special designations or management, and/or historic or cultural sites;
- Conflicts with existing or potential future land uses;
- Impacts to fish, wildlife, vegetation, special status species, and habitat including greater sage-grouse; big game migration and winter/spring range habitat for elk, mule deer, and pronghorn; bighorn sheep and desert tortoise habitat; habitat loss for raptors and migratory bird species; potential for increased bird collisions with transmission lines; and development of mitigation measures;
- Public health and safety, including fire risk, firefighter safety, electromagnetic fields, potential sabotage activities, structure/conductor failure near homes and increased construction traffic on roadways;

- Impacts to areas with special management designations, including to BLM Areas of Critical Environmental Concern (ACECs), BLM Wilderness Study Areas (WSAs), USFS Inventoried Roadless Areas (IRAs), national monuments/landmarks, national historic trails, and state and federal parks;
- Cumulative impacts of numerous transmission lines being proposed within already overcrowded corridors;
- Socioeconomic impacts, particularly property values and tax base where the Project would cross private lands or be located near urban areas; and
- Noxious weed control and reclamation, including potential for the spread of noxious and invasive weeds along new ROWs, and the need for appropriate control measures.

Cooperating agency participation continued to occur during the preparation of the EIS. The public is encouraged to review and provide comment during the Draft EIS comment period.

## **ES.2 Proposed Action and Alternatives**

### **ES.2.1 Proposed Action**

The Applicant proposed action would consist of the following facilities and improvements:

- A 600-kilovolt (kV) DC transmission line, approximately 725 miles in length, extending across public (state and federal) and private lands in Wyoming, Colorado, Utah, and Nevada. The transmission line ROW would be approximately 250 feet wide.
- Two terminal stations to be located on private or public lands at either end of the transmission line, near Sinclair, Wyoming, and at the Marketplace Hub in the Eldorado Valley, near Boulder City, Nevada.
- Access routes, including improvements to existing roads, new overland access, and new unpaved roads to access the proposed Project facilities and work areas during the construction, operation, and maintenance Project phases.
- Two ground electrode facilities to be located on private or public lands within 100 miles of each of the Northern and Southern terminals. These ground electrode facilities would be used to maintain system operations in the event of the loss of one or more poles (or circuits).
- Communication systems: a network of 12 to 15 fiber optic communication and regeneration sites, typically within the 250-foot-wide transmission line ROW, and microwave facilities at each terminal.

#### **ES.2.1.1 Design Options**

Two design options have been included to maintain Project flexibility. Under Design Option 2, the Project would construct a 600-kV DC transmission line to deliver energy from the Northern Terminal in Sinclair, Wyoming, to a new alternating current (AC)/DC converter station near the existing IPP substation near Delta, Utah. From the new AC/DC converter station in Utah, a single circuit 1,500-MW, 500-kV AC transmission line would be constructed to one of the existing substations in the Eldorado Valley, south of Boulder City, Nevada (Marketplace Hub).

Under Design Option 3, the Project would utilize a two-phase approach. During phase one, the portion of the transmission line from Sinclair, Wyoming, to the IPP substation near Delta, Utah, would be constructed (with 3,000-MW, 600-kV DC capability for phase two conversion) and operated as a 1,500-MW, 500-kV AC transmission system. Phase two would involve constructing the remaining portion of the 3,000-MW, 600-kV DC line from IPP to the Southern Terminal, south of Boulder City, Nevada, construction of the Northern and Southern terminals and ground electrode systems, and converting operations to a DC system. This approach would be required if the demand for Wyoming resources in the desert southwest proves to be slower in development than expected.

Implementation of the design options would only be considered under the conditions that sufficient capacity became commercially available to transmit energy delivered by the Project to California, and that the Project was able to establish commercial interconnection agreements with the utility owning and operating the IPP transmission line.

### **ES.2.1.2 Alternative Route Planning**

In developing a proposed route to facilitate the transmission of power to markets in the desert southwest region, multiple regional corridor studies were conducted. The Project history and process used in evaluating alternatives while developing the applicant's proposed route is documented in TransWest's Project Description Technical Report (PDTR) (**Appendix D**). The lead agencies conducted a corridor refinement process to identify potentially feasible corridors to be analyzed in the EIS, eliminating corridors that were duplicative or presented extensive resource constraints. The following criteria were used to retain alternatives for detailed analysis in the EIS:

- Does the alternative meet the applicants' required objectives for the proposed Project?
- Is the alternative technically and economically feasible?
- Does the alternative address resource conflicts?
- Does the alternative result in measurably diminished adverse environmental effects (fewer detrimental effects, less severe effects, or shorter-term effects) than the applicant's proposed corridor for any resource?

After receiving and addressing input from the BLM Interdisciplinary Team and cooperating agency reviewers, a range of alternative corridors were presented to the public during the public scoping period (January through April 2011). Scoping comments identified several issues that helped to inform the lead agencies' identification of those alternative corridors to retain for further analysis.

### **ES.2.1.3 Elements Common to all Action Alternatives**

Regardless of the transmission route or design option selected, there are specific Project requirements, constraints, and Project elements that apply to all action alternatives. These elements include federal environmental protection requirements and plan amendments, applicant-committed design features and environmental protection measures, and the facilities associated with the Northern and Southern terminals.

### **ES.2.1.4 Transmission Line Design, Construction, Operation and Maintenance**

The EIS Project description of alternatives and ancillary facilities was developed from the Project Preliminary Plan of Development (TransWest 2010) and from the PDTR (**Appendix D**). Chapter 2.0 provides descriptions of typical transmission line construction ROW and temporary work areas, the three types of transmission line structures under consideration, and typical tower erection and conductor stringing construction processes. Additional details on proposed Project facilities, construction methods, Project operation, and maintenance practices, including vegetation management, are provided in **Appendix D**.

During construction, the majority of the disturbance areas would be within the 250-foot-wide transmission line ROW; all disturbance areas would be located within the 2-mile transmission line corridor. During the operation and maintenance of the transmission line, tower location sites and communication sites would remain disturbed in place and all would be located within the 2-mile transmission line corridor. Access roads also would be located within the 2-mile transmission line corridor, to the extent practicable.

### **ES.2.1.5 Northern and Southern Terminals**

Terminals would be located at both the northern and southern ends of the Project. Both terminal stations would include an AC/DC converter station and adjacent AC substation. The AC/DC converter station would include a 600-kV DC switchyard; AC/DC conversion equipment; transformers; and multiple equipment, control,

maintenance, and administrative buildings. Two buildings would house the AC/DC conversion equipment; smaller buildings would house the control room, control and protection equipment, auxiliary equipment, and cooling equipment. Connections to the existing transmission infrastructure also would be constructed. The three major components (AC/DC converter station, 500-/230-kV AC substation, and 230-kV AC substation) are planned to be co-located and contiguous.

The Northern Terminal would be located approximately 3 miles southwest of Sinclair, Wyoming (Carbon County), on private lands. The Southern Terminal would be located at the Marketplace Hub in the Eldorado Valley, approximately 15 miles southwest of the metropolitan area of Boulder City, Nevada.

If Design Option 2 was implemented, the Northern Terminal would be constructed as in the proposed action. The Southern Terminal would be relocated to the IPP in Millard County near Delta, Utah. If Design Option 3 was implemented, a substation would be constructed near IPP under phase one and the Southern Terminal would be constructed in Nevada under phase two.

Section 2.4.3.1, Northern and Southern Terminals, provides descriptions of the Northern and Southern Terminal facilities and disturbance areas.

#### **ES.2.1.6 Ground Electrode Systems**

One ground electrode system would be required within approximately 100 miles of each of the Northern and Southern terminals to establish and maintain electrical current continuity during normal operations, and any unexpected outage of one of the two poles (or circuits) of the 600-kV DC terminal or converter station equipment. Facilities would consist of a small above-ground building and surrounding underground electrode bed wells and a lower voltage connector line from the 600-kV DC transmission line to each of the conceptual ground electrode sites. General siting areas and conceptual alternative site locations have been identified in Regions I and III; selection of specific location of the ground electrode systems would be identified during final engineering and design stages. The alternative route and potential design option selected would influence which set of ground electrode location alternatives could be considered for use.

#### **ES.2.1.7 Project Design Features, Best Management Practices, and Required Stipulations**

Project design features, best management practices (BMPs), and required stipulations are requirements for the construction, operation, maintenance, and decommissioning of the transmission line, regardless of which alternative is chosen in the ROD. These actions were all developed or mandated to avoid, minimize, or reduce impacts to resources and are required for implementation of the Project on BLM and USFS lands. **Appendix C** contains applicant-committed design features and environmental protection measures that TransWest voluntarily has proposed to minimize and/or avoid resource impacts regardless of land jurisdiction. TransWest has committed to review and augment their list of applicant-committed design features as needed to minimize impacts to the extent possible, as well as ensure conformance with all BMPs and resource- or area-specific stipulations related to surface disturbing activities from all pertinent resource management plans (RMPs) and land resource management plans.

#### **ES.2.1.8 Route Action Alternatives**

Due to the length of the transmission line, the alternative transmission routes were split into four distinct regions for the purpose of presenting clear impact comparisons between alternative segments:

- Region I: Sinclair, Wyoming, to northwest Colorado near Rangely, Colorado;
- Region II: Northwest Colorado to IPP near Delta, Utah;
- Region III: IPP to North Las Vegas, Nevada; and
- Region IV: North Las Vegas to Marketplace Hub near Boulder City, Nevada.

The alternative transmission line routes are depicted by region in **Figures 2-21** through **2-24**. The alternatives within each of these regions can be combined to define a distinct end-to-end route from Wyoming to Nevada.

Each alternative route is defined by a reference line, a nominal 250-foot-wide transmission line ROW, and a 2-mile transmission line corridor. Potential refinements to the reference line, referred to as micro-siting options, represent adjustments requested by the agencies to minimize resource or siting constraints. Final transmission line alignments and 250-foot-wide transmission line ROW locations would be determined during final engineering; however, all alignment changes would remain within the 2-mile transmission line corridor. Corridor alternative variations and alternative connectors also have been included in some locations to address specific regional or local concerns, or to provide additional routing flexibility in constrained areas. **Tables 2-3** and **2-4** summarize alternative variations and micro-siting options and alternative connectors by region.

The following subsections outline the alternative routes as well as the micro-siting options, variations, and connectors, by region.

### **ES.2.1.9 Region I: Sinclair, Wyoming, to Northwest Colorado near Rangely, Colorado**

Region I alternative routes, micro-siting options, alternative variations, alternative connectors, and ground electrode system alternative facilities are depicted on **Figure 2-21**.

#### Alternative I-A (Applicant Proposed)

TransWest's proposed reference line would begin in Sinclair, Wyoming, and would travel west just south of the I-80 corridor to Wamsutter. At Wamsutter, it would turn south and generally follow the Carbon-Sweetwater county line along a corridor preferred by the Wyoming Governor's Office and Carbon and Sweetwater counties. It then would continue south-southwest across the Wyoming-Colorado state line and south along a corridor preferred by Moffat County where it would intersect with U.S. Highway 40 just west of Maybell, Colorado. The reference line generally would parallel U.S. Highway 40, turning west toward the Colorado-Utah border.

#### Alternative I-B

Alternative I-B was the TransWest original proposed action. It was subsequently withdrawn and replaced by a revised ROW application reflecting their current proposed action. It was retained as Alternative I-B because it would follow an existing utility corridor, thereby reducing the proliferation of new corridors. The alternative would be the same as Alternative I-A to Wamsutter, and then differ as Alternative I-B would continue west for several miles before turning south along the West-wide Energy Corridor (WVEC). Alternative I-B would follow the WVEC to near the Colorado state line, where it would converge with Alternative I-A for approximately 15 miles, then diverge to the south and parallel Alternative I-A to the east with an offset of approximately 5 miles. It then would intersect with U.S. Highway 40 and follow Alternative I-A to the end of Region I.

#### Alternative I-C

This alternative was developed to reduce the overall proliferation of utility corridors and associated impacts by following existing designated utility corridors. Alternative I-C would begin by following Alternative I-A to near Creston, Wyoming, where Alternative I-C would turn south and parallel Wyoming State Highway 789 toward Baggs, Wyoming. From there, Alternative I-C would continue south, deviating from Highway 789 to the east and passing east of Baggs. After crossing into Colorado, this alternative would parallel Colorado State Highway 13 into Craig, Colorado. Alternative I-C would pass east and south of Craig, turning to the west after crossing U.S. Highway 40, generally paralleling the highway and joining with Alternative I-A to the end of Region I.



### Alternative I-D (Agency Preferred)

Alternative I-D was developed to reduce multiple resource concerns, including impacts to visual resources and greater sage-grouse. It would follow the route of Alternative I-A, going west from Sinclair, Wyoming (Carbon County, Wyoming), basically paralleling I-80 in a designated WVEC, until turning south near Wamsutter. It would follow Alternative I-A south for approximately 15 miles. Alternative I-D then would diverge to the east, where it generally would parallel Highway 789 at an offset distance of 2 to 5 miles to the west. Before reaching the Baggs area, Alternative I-D would turn west and follow the Shell Creek Stock Trail road for approximately 20 miles, where it would cross into Sweetwater County and again join Alternative I-A while turning south into Colorado (Moffat County).

### Region I Alternative Variations, Alternative Connectors, and Micro-siting Options

There are no alternative variations within Region I. Four alternative connectors were developed in Region I to provide the flexibility to combine alternative segments to address resource conflicts. Micro-siting options have been developed to address specific land use concerns in all Region I alternative routes related to the Tuttle Ranch Conservation Easement.

### Region I Ground Electrode System Alternative Facilities

There are eight potential locations for ground electrode systems in Region I. Three locations would apply to all alternatives; the remaining five locations would apply to only certain alternatives.

## **ES.2.1.10 Region II: Northwest Colorado to IPP near Delta, Utah**

Region II alternative routes, micro-siting options, alternative variations, and alternative connectors are depicted on **Figure 2-22**. There are no ground electrode system alternative facilities in Region II.

### Alternative II-A (Applicant Proposed)

The TransWest proposed reference line would continue into Utah in a westerly direction, then deviate south from Highway 40 toward Roosevelt, Utah. From Roosevelt, it would pass north of Duchesne, again paralleling Highway 40 for several miles, then turn southwest toward Nephi, near U.S. Highways 6 and 89. The reference line would pass through Salt Creek Canyon then north around Nephi. It would continue west and then turn southwest following a path north of and adjacent to IPP. Portions of this corridor have been identified as preferred in a joint resolution by representatives of Juab and Millard counties.

### Alternative II-B

Alternative II-B was developed to address impacts to private lands and to generally follow established utility corridors. These corridors are designated for underground utilities only and use of the corridor for the transmission line would require a plan amendment. The route would travel southwest in Colorado from the beginning of Region II, cross the Yampa River, and pass east of Rangely, Colorado. It would continue southwest where it would cross the Colorado-Utah state line and turn generally south, crossing back into Colorado in the Baxter Pass area. At that location, it would intersect the Interstate 70 (I-70) corridor, turning in a southwesterly and westerly direction, paralleling I-70. After passing south of Green River, Utah, Alternative II-B would diverge from I-70 and turn to the north along U.S. Highway 191. This highway generally would be followed until just south of the Emery-Carbon county line, where Alternative II-B would turn west and pass near the county line for approximately 25 miles. It generally would turn south, passing west of Huntington, Utah, before turning northwest passing northeast of Mount Pleasant, Utah. From there, it would pass through Salt Creek Canyon to Nephi, and then south around Nephi. It then would turn southwest and west adjacent to IPP, following a path south of Alternative II-A.

### Alternative II-C

Alternative II-C also would decrease impacts to private lands and generally would follow established utility corridors as well as avoid USFS IRAs. Alternative II-C would follow Alternative II-B through Colorado, along

I-70 into Utah, and north at Highway 191. Approximately 15 miles north on Highway 191, Alternative II-C would diverge from Alternative II-B and turn in a general westerly direction toward Castle Dale. Approximately 3 miles east of Castle Dale, this alternative would turn south and roughly parallel Utah State Highway 10 at a distance of approximately 3 miles to the east. The alternative would cross Highway 10 near the Emery-Sevier county line and turn west, again generally following the I-70 corridor into the Salina, Utah, area. Alternative II-C would pass south of Salina, turn north, and parallel U.S. Highway 50 toward Scipio, Utah. The alternative would turn west and pass Scipio on the south, then turn north, passing east of Delta, Utah, continuing into IPP.

#### Alternative II-D

This alternative was developed to avoid USFS IRAs and to provide additional northern route options to avoid impacts to historic trails and areas designated for special resource management along the southern routes (Alternatives II-B and II-C). It would begin along the same route as Alternative II-A. However, as it would enter Utah, it would diverge briefly to follow a designated utility corridor, causing it to zigzag once across Alternative II-A. It then would diverge to the south of the designated utility corridor and turn west-southwest. Alternative II-D would cross into Carbon County northwest of Price, and then turn southwest in the Emma Park area along Highway 191. It would follow this highway west of Helper, and then turn west toward Salt Creek Canyon where it would join and follow Alternatives II-B and II-E, then join and follow Alternative II-A into IPP.

#### Alternative II-E

Alternative II-E also was developed to provide additional northern route options to address the previously-mentioned resource impacts from the southern routes. This alternative would follow Alternative II-D into Utah and along the designated utility corridor, zigzagging across Alternative II-A. It then would rejoin Alternative II-A to continue east through Duchesne, Utah. Approximately 10 miles east of Duchesne, Alternative II-E would turn southwest and generally parallel Highway 191, offset by 1 to 6 miles. At the Utah-Carbon county line, this alternative would turn west through the Emma Park area, then northwest along U.S. Highway 6 until it would rejoin with Alternative II-A, following its siting to Salt Creek Canyon. At this canyon, Alternative II-E would begin to follow the alignment of Alternative II-B south of Nephi, then join and follow Alternative II-A adjacent and into IPP.

#### Alternative II-F (Agency Preferred)

This alternative combines portions of other alternatives in the region and contains unique segments in the Emma Park area that together would minimize impacts to USFS IRAs, Tribal and private lands, greater sage-grouse habitat, and avoid impacts to NHTs. It would begin in southwest Moffat County (Colorado) by following Alternative II-A in designated WVEC and BLM utility corridors. As it enters Utah (Uintah County), it would separate from Alternative II-A to the northwest and follow the designated utility corridors, which then turn southwest and cross Alternative II-A. It then would diverge to the south off of the designated WVEC (still following the BLM-designated corridor) and turn west-southwest, crossing the Uintah and Ouray Indian Reservation. It then would cross into Duchesne County, where it would turn west-southwest out of the BLM utility corridor and generally follow the southern county line, crossing into Carbon County northwest of Price where it would turn west-northwest and follow Highway 6 to Thistle (Utah County) through a portion of designated WVEC and BLM utility corridors. It then would turn south, following Highway 89 for about 10 miles before cutting south-southwest (Sanpete County) to Highway 132. At this highway, it would turn west into Nephi (Juab County) and follow a path south around the community, then turn southwest following a BLM-designated utility corridor that turns west into IPP north of Delta (Millard County), which is the end of the Project's Region II.

#### Region II Alternative Variations, Alternative Connectors, and Micro-siting Options

One alternative variation was developed to address potential impacts to the scenic and recreation issues along the Reservation Ridge Scenic Backway, while also considering BLM policy (IM 2012-043) regarding greater sage-grouse. Five alternative connectors were developed in Region II to provide the flexibility to combine alternative segments to address resource conflicts. Micro-siting options have been developed to address concerns with construction in Uinta National Forest IRAs at a location where the designated WVEC offsets

from a continual corridor in Alternative II-A, and within USFS IRAs along the edges of the Manti-La Sal National Forest in Alternatives II-A, II-E, and II-F.

#### **ES.2.1.11 Region III: IPP to North Las Vegas, Nevada**

Region III alternative routes, alternative variations, alternative connectors, and ground electrode system alternative facilities are depicted on **Figure 2-23**. There are no micro-siting options in Region III.

##### Alternative III-A (Applicant Proposed)

The TransWest proposed reference line would leave IPP to the west and turn south toward Milford, Utah, following the WWEC. For the remainder of Utah, the reference line roughly would parallel Interstate 15 (I-15) approximately 20 miles west of the highway. The reference line would pass west of Milford, then generally trend south-southwest, passing east of Enterprise, Utah, and directly west of Central, Utah; exiting Utah just north of the southwest corner of the state. In Nevada, the line would cross I-15 west of Mesquite, Nevada, and remain on the south side of I-15 until reaching the North Las Vegas area northeast of Nellis Air Force Base.

##### Alternative III-B (Agency Preferred)

Alternative III-B was developed to decrease resource impacts in southwestern Utah (including potential impacts to the Mountain Meadows National Historic Landmark and Site and IRAs in the Dixie National Forest). It would begin following Alternative III-A through Millard and Beaver counties. Near the Beaver-Iron county line, it would diverge toward the west. Alternative III-B would follow a west-southwest course, crossing into Lincoln County, Nevada, near Uvada, Utah, where it would turn to a general southerly direction, rejoining Alternative III-A to the northwest of Mesquite. It then would diverge to the west from Alternative III-A approximately 16 miles west of Mesquite, cross into Clark County, pass southeast of Moapa, Nevada, pass through the designated utility corridor on the Moapa Reservation, and rejoin Alternative III-A approximately 4 miles north of the end of Region III.

##### Alternative III-C

Alternative III-C also was developed to address the same resource impacts as Alternative III-B and to take advantage of an existing corridor with existing transmission line development, thereby potentially consolidating cumulative transmission line impacts. This alternative would follow Alternatives III-A and III-B before diverging from them shortly after traveling west out of IPP, where it would follow the existing IPP power line to the south for approximately 30 miles and then rejoin Alternative III-B to the Utah-Nevada state line. After passing into Nevada at Uvada, Alternative III-C would turn west away from Alternative III-B, passing north of Caliente, Nevada; turning south approximately 15 miles west of Caliente. This alternative would follow that southern course, intersecting with U.S. Highway 93 and paralleling the highway for all but the last 15 miles into North Las Vegas. Alternative III-C would rejoin Alternative III-A northeast of Nellis Air Force Base at the end of Region III.

##### Region III Alternative Variations and Alternative Connectors

Three alternative variations were developed to address potential impacts to the Mountain Meadows National Historic Landmark resulting from Alternative III-A. Two alternative connectors were developed in Region III to provide the flexibility to combine alternative segments to address resource conflicts.

##### Region III Ground Electrode System Alternative Facilities

There are eight potential locations for ground electrode systems in Region III. Three of the locations would apply only to Alternative III-A, three would apply only to Alternative III-B, one would apply only to Alternative III-C, and one would apply only if Design Option 2 were to be implemented.

### **ES.2.1.12 Region IV: North Las Vegas to Marketplace Hub near Boulder City, Nevada**

Region IV alternative routes, alternative variations, and alternative connectors are depicted on **Figure 2-24**. There are no micro-siting options or ground electrode system alternative facilities in Region IV.

#### Alternative IV-A (Applicant Proposed and Agency Preferred)

The TransWest proposed action would follow a designated WWEC, pass North Las Vegas to the east, and cross the congressionally designated Sunrise Mountain Instant Study Area (ISA). Crossing the ISA may entail congressional legislation modifying the designation (see Section 3.15, Special Designations, for details). It would run between Whitney, Nevada, and the Lake Las Vegas development skirting the edge of Henderson, Nevada. It would then turn in a general southwest direction to the Marketplace endpoint.

#### Alternative IV-B

Alternative IV-B was developed to provide an alternative that does not require crossing the Sunrise Mountain ISA. It would follow the proposed alternative for approximately 7 miles, diverge to the southeast as it passed directly east of Nellis Air Force Base and travel south through the Lake Mead National Recreation Area (NRA), passing between the Lake Las Vegas development and Lake Mead. Along the south edge of Lake Las Vegas, it would turn southwest, north of Boulder City, Nevada, then turn west and join with Alternative IV-A west of Henderson to the Marketplace endpoint.

#### Alternative IV-C

Alternative IV-C also would provide an alternative that does not cross Sunrise Mountain ISA. In addition, it would decrease impacts to populated areas. This alternative would follow Alternative IV-B through the Lake Mead NRA and between the Lake Las Vegas development and Lake Mead to north of Boulder City. It would then continue south before it turned southwest around the southeast edge of Boulder City, and into the Marketplace endpoint.

#### Region IV Alternative Variations and Alternative Connectors

One alternative variation was developed to address impacts to private lands. Five alternative connectors were developed in Region IV to provide the flexibility to combine alternative segments to address resource conflicts.

### **ES.2.2 No Action Alternative**

Under the No Action Alternative, the BLM or USFS would not issue ROW grants or special use permits and the Project would not be constructed. Under the No Action Alternative, Western would not provide funding to the Project.

### **ES.2.3 Alternatives Considered but Eliminated**

During scoping, numerous questions were raised regarding the ability to route the transmission line, or portions of the transmission line, underground. Underground cable systems have been considered and evaluated for the Project. To date, underground cable technology required to meet the applicant's objectives is not available, nor is it reasonably foreseeable that it would become available within the timeframe for the construction of the Project. Therefore, undergrounding all or portions of the Project was not considered a viable alternative and has been eliminated from further analysis.

Additionally, a number of corridor segments were considered through the public scoping period, but subsequently have been eliminated from detailed analysis in this EIS by the lead agencies. **Table 2-22** identifies the segments and notes the rationale for elimination from detailed analysis.

### ES.2.4 Agency Preferred Alternative

The BLM determined the preferred alternative within each Project region with input from the cooperating agencies. The agency preferred alternative is subject to change when public input received during the Draft EIS public comment period is considered. The agency preferred alternative was identified using criteria linked to Council on Environmental Quality criteria for determining significant impacts. These criteria were broadened and refined based on input from the Project's cooperating agencies regarding other key resource concerns as follows:

1. Maximizes the use of appropriate (e.g., non-underground-only) existing designated utility corridors by locating within or paralleling areas of existing utility ROWs.
2. Minimizes the need for plan amendments through conformance to land use plans.
3. Avoids or minimizes resource impacts that are regulated by law (Endangered Species Act, Clean Water Act, National Historic Preservation Act, wilderness, WSAs, ISAs, IRAs, etc.) after consideration of Project design features and agency BMPs. This includes impacts to greater sage-grouse.
4. Avoids or minimizes proximity to private residences and residential areas, thereby addressing concerns with public health and safety, aesthetics, visual effects, and others.
5. Avoids or minimizes resource impacts that demonstrate potentially unavoidable adverse impacts (residual impacts) after consideration of Project design features and agency BMPs, even though they may not be specifically regulated by law.
6. Minimizes use of private lands, assuming natural resource impacts are more or less similar.
7. If multiple alternatives meet the preceding criteria, the agency preferred alternative would be the alternative that minimizes construction, operation, and maintenance expense and/or time.

### ES.3 Affected Environment and Environmental Consequences

The following section summarizes the affected environment and environmental consequences analysis contained in Chapter 3.0 of the Draft EIS. A summary of impacts from the Project's action alternatives is provided by Project region in **Tables 2-23 through 2-26**. **Table 2-27** compares the applicant proposed route with the agency preferred route on a Project-wide basis (sum of impact parameters across the four Project regions). Cumulative impacts of the Project are presented in Chapter 5.0.

#### ES.3.1 Air Quality

The existing air quality of most of the analysis area is typical of the largely undeveloped regions of the western U.S. Current sources of air pollutants in the region include wildland fires, mining, agriculture, industrial sources, urban transportation, vehicular travel on unpaved roads, construction activities, and disturbed land. All of the northern portions of the analysis area have been designated as attainment areas for all pollutants that have ambient air quality standards; however, Clark County, Nevada, is designated as nonattainment or maintenance area for specific pollutants. Impacts to air quality include increases in criteria pollutants, including fugitive dust emissions, emissions of hazardous air pollutants, and green house gas emissions. Neither the construction nor operations phase of the proposed action or alternatives is expected to cause or contribute to any violation of any state or federal ambient air quality standard; interfere with the maintenance or attainment of any state or federal ambient air quality standard in the analysis area; increase the frequency or severity of any existing violations of any state or federal ambient air quality standard in the analysis area; delay the timely attainment of any standard, interim emission reduction, or other air quality milestone promulgated by the U.S. Environmental Protection Agency (USEPA) or state air quality agency; cause any adverse impacts to air quality related values; cause any adverse impact to air quality related values in a federal Class I area; or exceed state or federal general conformity thresholds. Impacts by region and alternative are shown in **Tables 2-23 through 2-26**.



### ES.3.2 Geological, Paleontological, and Mineral Resources

The proposed Project covers several physiographic provinces including the Wyoming Basins, Colorado Plateau, Middle Rocky Mountains, and Basin and Range provinces. Region I analysis area has low earthquake activity, moderate to high susceptibility and low incidence of landslides, and contains areas that may be subject to ground subsidence. There are important fossil bearing formations and major mineral resources in the area. Region II analysis area has a number of potentially active fault zones, moderate to high incidence and susceptibility to landslides, and areas that may be subject to ground subsidence. There are important fossil bearing formations and major mineral resources in the area. Region III has several potentially active faults, generally low landslide susceptibility, and contains some areas with subsidence risk. There are three high-potential fossil-bearing formations and important mineral resources in the area. Region IV analysis area has some fault areas but ground movement from an earthquake is expected to be low and there is low incidence and susceptibility to landslides. The Las Vegas Valley experiences subsidence due to groundwater withdrawal but the analysis areas does not cross any subsidence areas. There are no high fossil potential formations in the area.

Impacts from landslides or unstable ground would result in damage to structures and ultimately disruption in service. Electrical transmission lines have reportedly been impacted by ground stability hazards on the Wasatch Plateau and structural failure and relocation of transmission line routes have resulted because of landslides due to anomalous precipitation events. Ground subsidence also would result in the loss of ground support to structures with the potential to damage and disrupt operations. The risk of damage from seismicity, landslides, or subsidence would be substantially reduced through implementation of BMPs, design features, and mitigation. The proposed Project is not expected to preclude or restrict access to minerals resources. Project construction and operation would not be expected to result in the loss or damage of scientifically important paleontological resources. Indirect impacts may occur to paleontological resources over an extended period of time because of increased access to medium to high fossil potential formations. The BMPs and design features that protect paleontological resources discussed in construction impacts would lessen the risk; however, the resource would still be at risk through the continuation of natural processes (e.g., erosion) and unauthorized collection. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### ES.3.3 Soils

All four Project regions contain soils that are prone to compaction, prone to wind or water erosion, have limited revegetation potential, or which are corrosive to cement and steel structures. Additionally, Region II contains soils that are susceptible to the development of large sinkholes, piping, and subsidence. The Region I, II, and III analysis areas contain prime farmlands.

In general, the impacts to soils associated with construction of the transmission line would be temporary. Direct impacts to soil resources would include the clearing or crushing of surface cover (vegetation, duff, litter) and blading/grading of soils for structure construction. During construction, the soil profiles would be mixed with a corresponding loss of soil structure. Soil compaction would result from the movement of heavy equipment and vehicles during construction activities. Soil compaction and a reduction in ground cover would lead to an increase in bulk density, increased runoff, and erosion. Long-term losses of prime farmland could occur if structure foundations or facilities are required in prime farmlands. Agency BMPs would reduce impacts to soils from uneven settling, compacted surfaces, and physical crusts reducing water infiltration. Monitoring of erosion controls after storm events would keep erosion control in effective working order and reduce or prevent sediment from moving off-site. Implementation of design features, agency BMPs, and mitigation measures would effectively control erosion from disturbed areas reducing the loss of surface soils and potential sedimentation effects. Additional mitigation has been proposed to locate structures away from prime farmlands. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### ES.3.4 Water Resources

The water resources analysis area consists of 179 hydrographic watersheds within the North Platte, Great Salt Lake, Upper Colorado, and Lower Colorado River hydrographic regions. The North Platte Region drains the

east side of the Continental Divide and ultimately empties to the Gulf of Mexico. The Upper Colorado Region, Lower Colorado Region, and Great Basin Region all drain the western side of the Continental Divide; the Upper and Lower Colorado regions ultimately drain toward the Gulf of California, while the Great Basin Region generally drains toward the Great Salt Lake. Surficial aquifers are present in the floodplains of major surface water features and the low-lying areas of the Basin and Range area. Springs and seeps are found throughout the analysis area. Region I, II, III, and IV analysis areas contain 9, 28, 11, and 3 impaired waterbodies, respectively.

Water quality could be impacted both directly and indirectly from construction of waterway crossings, which could result in channel instability and increased sediment supply from disturbed areas directly adjacent to the crossings. This may in turn cause increased sediment from mass wasting of channel banks, and down-cutting of the streambed, with resultant changes in channel geomorphology. Consultation would be conducted with the managing land agency regarding relevant standards and guidelines for waterbody road-crossing methods. Direct impacts would be greatest for short periods of time during construction and through the reclamation process until successful revegetation occurred. The applicant will develop a management plan to avoid, reduce, and/or minimize adverse impacts to any streams having impaired uses due to elevated sediment concentrations or constituents that might be present in stormwater runoff. Indirect impacts to water quality could occur from ground disturbance in upland areas when precipitation events would cause overland runoff to erode bare soils and transport sediment to waterways. The design features and BMPs discussed in the Erosion Control Plan and Storm Water Pollution Prevention Plan would minimize runoff and erosion from disturbed areas. Although increased erosion would be expected because the disturbance would be dispersed along the linear path of the Project, no alterations to the existing drainage patterns or increases of off-site erosion would be expected from the disturbance of upland areas by the Project. Because existing water rights (current depletion) would be utilized, no new impacts to other water users or the water source would be anticipated. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.5 Vegetation**

There are 20 vegetation communities and developed/disturbed land located within the analysis area. The shrubland cover type is the dominant land cover type within the analysis area, comprising 54 percent of the area. Forest and woodlands cover type comprises the second largest percentage (21 percent) of the analysis area.

Direct surface disturbing impacts to vegetation would include the trampling/crushing of vegetation, the removal of vegetation, and soil compaction. Indirect effects to vegetation would include increased erosion, sedimentation, fugitive dust generation, habitat fragmentation, and the potential spread and establishment of noxious and invasive weed species. Noxious weed invasions into disturbed areas may result in incremental changes to the fire regimes for each vegetation community. The land cover type with the highest overall risk of accidental fires spreading upon ignition is sagebrush shrubland. The removal of woody vegetation over 6 feet in height could result in changes in vegetation community structure. Depending on the species present, woody communities could temporarily or permanently shift to communities dominated by herbaceous and/or low growing shrubs. In addition, increased light and open areas in the ROW could lead to increased noxious and invasive weed species establishment and spread. Although vegetation communities would recover at varying rates, it is estimated that overall, herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations. Woody-dominated plant communities would require at least 10 to 25 years for recolonization; re-establishment of mature woodlands would require at least 30 to 50+ years. Depending on composition, recovery could take up to 31 to 100 years to achieve mature trees of similar stature to pre-construction conditions. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.6 Special Status Plant Species**

A total of 304 special status plant species were evaluated for potential occurrence within the 2-mile transmission line corridor. After consideration of habitat requirements and known distribution, 141 special

status plant species were carried forward for detailed analysis in this EIS. This includes 15 federally listed and 3 candidate species. Region II contains the highest number of special status plant (84) followed by 51 species in Region III. Region I and IV each contain fewer than 25 species.

The types of direct and indirect effects of construction activities generally are the same as those discussed for vegetation resources, and could result in loss of individuals and/or populations and loss of potentially suitable habitat. Other direct effects include the potential loss of pollinators, increased opportunities for illegal collection of individual special status plant species, and habitat fragmentation. Additional indirect impacts associated with operations would result from the vegetation maintenance for the ROW. Design features, BMPs, and additional proposed mitigation would reduce these impacts.

Based on species occurrence information and habitat associations, the special status plant species that may be impacted by the Project in Region I include 23 BLM sensitive species and 1 federally listed species. Within Region II, there are 62 BLM sensitive species, 18 USFS sensitive species, and 14 federally listed plant species that may be impacted by the Project. Within Region III, there are 46 BLM sensitive species, 2 USFS sensitive species, 5 Nevada state-listed species, and 4 federally listed species that may be impacted by the Project. Within Region IV, there are 18 BLM sensitive species, 8 NPS sensitive species, 5 Nevada state-listed species, and 1 federally listed species that may be impacted by the Project. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.7 Wildlife**

Big game species that occur within the analysis area include pronghorn, mule deer, white-tailed deer, elk, moose, Rocky Mountain bighorn sheep, and desert bighorn sheep. Small game species that occur within the analysis area include upland game birds, small mammals, furbearers, and waterfowl. A diversity of nongame species (e.g., small mammals, raptors, passerines, and reptiles) occupies a variety of habitat types within the analysis area.

Construction-related impacts primarily are habitat loss, fragmentation, and wildlife mortalities as a result of vehicle collisions and crushing of nests/burrows. Implementation of design features and agency restrictions to prevent disturbance to wintering big game species in identified crucial winter habitat would minimize direct impacts to wintering big game species. Similarly, direct impacts to small game would be limited during sensitive periods (e.g., nesting and breeding). TransWest also has committed to implementing raptor seasonal timing restrictions in applicable areas. Remaining impacts to wildlife would be limited to habitat loss and/or fragmentation. Similarly, noise and human presence impacts to wildlife species would be limited to habitat loss outside of key breeding times within important habitat types and protection buffers.

The primary operation-related impact associated with transmission lines and associated facilities is wildlife mortalities as a consequence of electrocution or collision with transmission line components. Other potential impacts include habitat avoidance due to the presence of a transmission line or maintenance noise and human presence. To minimize potential operation-related impacts to wildlife as a result of the proposed Project, TransWest's design feature requires that the Project meet or exceed the raptor safe design standards described in the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interactive Committee 2006). Anti-perching within key greater sage-grouse habitat also would benefit other wildlife prey species. Even with implementation of the proposed design features, there would be some remaining potential for avian collisions with the transmission line and towers. However, the potential for electrocution impacts to bird species would be negligible. Wildlife prey species also would be impacted given the potential for increased avian predator populations nesting on power line structures. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.8 Special Status Wildlife Species**

A total of 120 special status wildlife species were carried forward in this EIS: 12 terrestrial invertebrates, 19 reptiles, 51 birds, and 38 mammals. There are 12 federally listed wildlife species (1 reptile, 7 birds, and

4 mammals) within the Special Status Wildlife Analysis Area, as well as 2 federal candidate species (greater sage-grouse and western yellow-billed cuckoo).

Construction impacts account for all disturbances caused during construction of the proposed Project, including vegetation removal, increased human activity, and increased noise levels. The primary impacts associated with operation of transmission lines and associated facilities are mortalities as a consequence of electrocution or collision with Project components.

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include 2 federally listed and 2 candidate species and 64 BLM sensitive and state-protected species. The federally listed and candidate special status species are the greater sage-grouse (Candidate), western yellow-billed cuckoo (Candidate), black-footed ferret (Endangered; Experimental Non-essential), and the grey wolf (Endangered in Utah and Colorado; Experimental Non-essential in Wyoming). Region I impacts by alternative are shown in **Tables 2-23**.

Special status wildlife species that maybe impacted in Region II include 5 federally listed and 2 candidate species and 65 BLM sensitive, USFS sensitive, and state-protected species.

The federally listed and candidate special status species are the greater sage-grouse (Candidate), western yellow-billed cuckoo (Candidate), Mexican spotted owl (Threatened), black-footed ferret (Endangered), Canada lynx (Threatened), grey wolf (Endangered in Utah and Colorado), and the Utah prairie dog (Threatened). Region II impacts by alternative are shown in **Tables 2-24**.

Special status wildlife species that may be impacted in Region III include 5 federally listed and 2 federal candidate species and 77 BLM sensitive, USFS sensitive, and state-protected species. The federally listed and candidate special status species are the desert tortoise (Threatened), California condor (Endangered; Experimental Non-essential), greater sage-grouse (Candidate), Yuma clapper rail (Endangered), western yellow-billed cuckoo (Candidate), southwestern willow flycatcher (Endangered), and the Utah prairie dog (Threatened). Region III impacts by alternative are shown in **Tables 2-25**.

Special status wildlife species that may be impacted in Region IV include 3 federally listed and 1 federal candidate species and 65 BLM sensitive, USFS sensitive, and state-protected species. The federally listed and candidate special status species are the desert tortoise (Threatened), western yellow-billed cuckoo (Candidate), southwestern willow flycatcher (Endangered), and the Yuma clapper rail (Endangered). Region IV impacts by alternative are shown in **Tables 2-26**.

### **ES.3.9 Aquatic Biological Resources**

There are 26 game fish species, subspecies, or hybrids that occur within the analysis area. Most of the species are trout; other species are from the catfish, sunfish, temperate bass, perch, sturgeon, and smelt families. Waterbodies within the analysis area also support nongame fish species represented by suckers, minnows, and sculpins; invertebrate communities that include a mixture of worms, immature and adult insect groups, crustaceans, snails, and other groups; and habitat for amphibians (salamanders, toads, and frogs) and aquatic reptiles (turtles). Aquatic invasive species and whirling disease are issues within streams and lakes/reservoirs in all four states.

Equipment and vehicle traffic within the ROW and access roads could cross small and moderate-size streams or springs. Vehicle crossings would result in mortalities to macro invertebrates and possibly early life stages of fish. Through the implementation of BMPs, design measures, and additional mitigation measures, stream crossings would not permanently remove habitat and detrimentally affect fish population numbers, and macroinvertebrate composition and numbers would recover during subsequent colonization. Stream crossings would alter bottom substrates, and construction at stream crossings would remove riparian vegetation that provides cover for fish, shading, bank stability, and increased food and nutrient supply. The disturbed area would be restored to pre-construction conditions after construction is completed. Given the relatively small

width of the disturbance area associated with an individual stream crossing, impacts would be considered low in relation to the entire stream system.

The installation of culverts would result in a permanent loss of aquatic habitat. Stream crossings by vehicles and equipment pose a risk of transferring invasive aquatic species between drainages during construction. This risk would be reduced through Invasive Aquatic Species Protection mitigation measures. Effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed.

### **ES.3.10 Special Status Aquatic Species**

Fifty-five special status aquatic species were evaluated in terms of potential occurrence within the analysis area. Twenty fish, 5 amphibians, and 3 invertebrates were carried forward in this EIS, including 7 federally listed and 1 candidate fish species. Aquatic habitat in the analysis area used by special status aquatic species includes streams, springs, and wetlands. No lakes or reservoirs are inhabited by special status aquatic species. Region II contained the highest number of species (19), followed by 12 species in Regions I and III. One species occurs within the Region IV analysis area.

The types of direct and indirect effects of construction activities generally are the same as those discussed for aquatic biological resources, including disturbance to aquatic habitat from vehicle crossings and culvert installation, removal of riparian vegetation, and increased sedimentation and fuel spill risks. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

An effect determination of new and existing water depletions would be completed after identifying the water sources for construction and whether there is any connection between these water sources and surface flows in the Colorado Basin, Utah Lake/Provo River drainage, and the Platte sub-basin.

### **ES.3.11 Cultural Resources**

The analysis area for cultural resources encompasses a 2-mile-wide corridor along each alternative, including portions of Wyoming, Colorado, Utah, and Nevada. A cultural resource files search was conducted to identify all previously conducted archaeological investigations and previously recorded cultural resources within the analysis area. There have been 122 historic sites and 72 historic components previously documented in the Wyoming portion of analysis area, 257 historic sites and 33 historic components previously documented in the Colorado portion of the analysis area, 721 historic sites and 61 historic components previously documented in the Utah portion of the analysis area, and 221 historic sites and 18 historic components previously documented in the Nevada portion of the analysis area.

The Project's ground-disturbing activities would have the potential to directly impact historic properties, including traditional cultural properties and properties of traditional religious and cultural importance to Native American Tribes. These physical impacts could occur to both known sites and subsurface sites and could result in the vertical and horizontal displacement of soil containing cultural materials, damage to or destruction of artifacts and features, and loss of archaeological data. Visual impacts to historic properties (as well as cultural/historic landscapes) where setting is an aspect of integrity could occur as a result of introducing visual elements out of character with a property located within the visual area of potential effects.

At this time, the number of historic properties that would be adversely affected by the Project is unknown. As stipulated in the draft Programmatic Agreement (PA), an intensive Class III pedestrian inventory would be required after the agency preferred alternative is selected by the BLM and Western and before construction, to allow for the National Register of Historic Places (NRHP) evaluation of identified sites, impact assessments, and mitigation, if necessary. If the BLM and Western determine that a property would be adversely affected, mitigation would be proposed in accordance with the draft PA. Visual impacts to historic properties where setting contributes to their NRHP eligibility and from which the Project would be visible would be determined through viewshed analysis, on-site inspection, and photo inspection. Adverse effects to the integrity of a



property's setting would be minimized or mitigated as stipulated in the draft PA. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the draft PA. Site file search data by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.12 Visual Resources**

The analysis area for visual resources comprises the viewsheds of the Project's reference lines out to 20 miles in locations where they cross tree-covered landscapes and out to 5 miles in shrub, grassland, and cropland landscapes. Project's setting intersects the high plains, mountains, plateaus, valleys, and desert landscapes of Wyoming, Colorado, Utah, and Nevada, respectively, and includes the following physiographic provinces: Wyoming Basin Province; Uinta Basin section of the Colorado Plateaus Province; Northern Canyonlands section of the Colorado Plateaus Province; Middle Rocky Mountains Province; High Plateaus of Utah section of the Colorado Plateaus Province; Great Basin section of the Basin and Range Province; and Sonoran Desert section of the Basin and Range Province.

Visual resources impacts would occur during the construction phase of the Project and would be caused by vegetation clearing within the ROW and ground disturbance for access roads, transmission line, terminal, and electrode bed construction. Impacts would continue into the operational phase with visibility of structures, overhead conductors, cleared ROWs in tree-covered landscapes, access roads, terminal areas, and electrode bed areas and associated roads and small voltage electrical lines. In undeveloped areas, transmission line elements would contrast with existing characteristic landscapes to a moderate to strong degree. In viewsheds with existing electrical transmission line structures and ground disturbances, contrasts would be weak to moderate, depending on distance from the observer and number and type of structures. In all cases, construction activities occurring in the immediate foreground of the observer would cause greater contrasts than those appearing at a further distance. Direct impacts to people and scenery would be expected to be moderate to high and contrasts would comply with BLM Visual Resource Management (VRM) Class IV management objectives, and be consistent with USFS Low and Very Low Scenic Integrity Objectives (SIO) and USFS Modification and Maximum Modification Visual Quality Objectives (VQO). Project construction activities, as discussed in the plan of development, that are located within 0.5 mile of high or moderate sensitivity viewers and have strong or moderate contrasts, would not be expected to comply with BLM VRM Class III, or be consistent with USFS SIO High or Medium, and USFS VQO Retention or Partial Retention management objectives. Mitigations involving distances greater than 0.5 mile typically would reduce visual contrasts to moderate and, therefore, result in compliance with VRM Class III, and consistency with SIO Medium and VQO Partial Retention management objectives.

Indirect viewshed impacts would result from disturbance by human recreational activities, artifacts of activities, and vehicles with access to scenic landscapes by the Project's permanent access roads. Indirect impacts during operation would be expected to comply with agency management objectives in BLM VRM Class III and IV areas and be consistent with USFS SIO Medium and Low or USFS VQO Partial Retention, Modification, or Maximum Modification management objectives. Indirect impacts in the immediate foreground 0.25 mile from sensitive viewers may not comply with BLM VRM Class II management objectives or be consistent with USFS SIO High or USFS VQO Retention management objectives. It is expected these impacts would be mitigated (if possible) on a case-by-case basis. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.13 Recreation Resources**

The majority of recreation resources within the analysis area occur on federal lands managed by the BLM and USFS. Dispersed, unstructured activities typify the recreational uses occurring on public (federal and state) lands throughout the majority of the analysis area. Dispersed recreation in the analysis area includes motorized and non-motorized activities such as undeveloped camping, fishing, hiking, horseback riding, rock and ice climbing, mountain biking, snowmobiling, caving, off-highway vehicle (OHV) trail riding or open area use, and driving for pleasure. Developed recreation sites on federal and state lands in the analysis area include campgrounds, picnic areas, information and interpretive sites, trailhead facilities, boat ramps, and

fishing accesses. Most are provided by federal agencies, though there are some city- or county-managed recreation areas as well as privately owned recreation facilities.

During construction, noise or visual presence of construction activities could temporarily affect the experiences of visitors participating in dispersed or developed recreation opportunities near the construction area (generally limited to those areas within the 2-mile transmission line corridor). Construction is expected to affect recreation use particularly on the weekends; seasons of use may vary by region. At peak construction levels, human activity would be high and noise generally would be above existing background levels within the entire width of the 2-mile transmission line corridor. Some user groups would be more affected by habitat removal, noise and visual disturbance than others; for example, hunters, wildlife viewers and non-mechanized users groups, whose recreation experience is dependent upon quiet wilderness experiences or undisturbed wildlife would be more affected than OHV users or other activities for which vegetation removal, noise, and human activity does not affect the recreation experience. Construction also could temporarily affect the ability of visitors to participate in dispersed recreation opportunities by limiting access. Operations would result in permanent visual impacts to areas along the transmission line, including areas used for dispersed recreation. While these impacts would not appreciably affect the availability of the recreation resource used while engaging in dispersed recreational activities (i.e., big game or fishing habitat), the setting in which they occur would be affected visually and some user groups may choose to recreate elsewhere. In general, suitable substitute locations would exist nearby for the same dispersed recreational activities. Exceptions are described by region. Project access routes would be evaluated on a case-by-case basis by the appropriate federal or state land manager to determine whether to close to the public, close and reclaim, or leave open as part of the transportation network. Closed roads may become an attractive nuisance and lead to unauthorized OHV use. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### ES.3.14 Land Use

The analysis area includes portions of 4 states, 5 national forests, 15 BLM FOs, 24 counties, and 56 communities. Over 60 percent of the analysis area is federally managed land. The majority of the Region I analysis area is BLM land, mostly used for oil and gas production and grazing. Approximately 50 percent of the Region II analysis area is BLM land; approximately 10 percent is USFS land. Major land uses include oil and gas development, grazing, agriculture, forestry, and recreation. Over 75 percent of the Region III analysis area is BLM land. Most of the BLM land is within military operation areas. Nearly one-third of the Region IV analysis area is BLM land and one-third is federal land managed by the NPS (Lake Mead NRA) and the Department of Energy. Major land uses include urban development in the Las Vegas metropolitan area, and recreation areas and trails associated with the conservation areas on the eastern edge of the urban area.

Impact considerations include consistency with federal, state, regional, or local land use plans; impacts to agricultural activities and/or livestock grazing; and changes to land use authorizations and effects to realty actions on federal lands. No changes to current jurisdiction from the construction and operation of the Project alternative routes are anticipated. Most of the affected counties provide for the development of large transmission lines and associated facilities through zoning regulations; however, transmission lines development is not addressed in all zoning ordinances. Locations where the Project would not conform to existing federal agency management plans are discussed in Chapter 4.0. It is not anticipated that occupied residences would be removed within the 250-foot-wide transmission line ROW under any alternative. Potential land use authorizations conflicts would be addressed on a case-by-case basis with each federal land management agency. Short-term disruption of farming activities along the ROW could occur locally during construction. With the exception of land occupied by towers and access roads, farmland and range land within the construction zone would be available for agricultural use following the completion of construction. Direct impacts to grazing include the loss of forage, fragmentation of grazing allotments, potential impacts to lambing areas and disruption of lambing periods, increased mortality and injuries to livestock resulting from increased vehicle traffic, and temporary displacement of livestock from preferred grazing areas or range improvements (including water sources). Indirect impacts would include the spread of noxious and invasive species and fragmentation of allotments. The implementation of the proposed mitigation measures would minimize impacts to range improvements. Impacts to land use by region and alternative are shown in **Tables 2-23** through **2-26**.

### ES.3.15 Special Designation Areas

Special designation areas (SDAs) are units of land managed by federal or state agencies for the protection and enhancement of specific resource values. Congressionally designated SDAs within the analysis area include national wildlife refuges, wilderness areas, WSAs, wild and scenic rivers (WSRs), national conservation areas (NCAs), national historic trails, and other similar management areas. Agency-designated SDAs consist of ACECs (BLM) and IRAs and unroaded/undeveloped areas (USFS).

Within Region I, the SDAs that would be impacted by one or more of the alternatives are the Continental Divide National Scenic Trail, the Dinosaur National Monument, and two trails being considered for inclusion into the National Historic Trails system (the Overland Trail and the Cherokee Trail).

Within Region II, the SDAs that would be impacted by one or more of the alternatives are the Dinosaur National Monument, Old Spanish National Historic Trail, Oil Spring Mountain WSA and ACEC, White River Riparian ACEC, McInnis Canyons National Conservation Area, Badger Wash ACEC, Demaree WSA, Lower Green River Wild and Scenic Rivers Glossary/ACEC, Lears Canyon ACEC, Nine Mile Canyon ACEC, San Rafael Canyon ACEC, and Rock Art ACEC, 5 IRAs and 6 unroaded/undeveloped areas within the Ashley National Forest, 2 IRAs and 7 unroaded/undeveloped areas within the Fishlake National Forest, 7 IRAs and unroaded/undeveloped areas within the Manti-La Sal National Forest, and 9 IRAs within the Uinta National Forest.

Within Region III, the SDAs that would be impacted by one or more of the alternatives are the Desert and Pahrangat national wildlife refuges, Old Spanish National Historic Trail, the Beaver Dam Wash NCA, Beaver Dam Slope ACEC, Mormon Mesa Ely ACEC, Beaver Dam Slope ACEC, Clover Mountains Wilderness, Kane Springs ACEC, Delamar Mountains Wilderness, Mormon Mesa ACEC, Coyote Springs Valley, Arrow Canyon Wilderness, and the Muddy River and Meadow Valley Wash WSRs. The proposed action or alternatives also would encompass portion of six IRAs and four unroaded/undeveloped areas within the Dixie National Forest. Additionally, there are four USFWS proposed wilderness areas within the analysis area.

Within Region IV, the SDAs that would be impacted by one or more of the alternatives are the Sloan Canyon NCA, Black Mountain Wilderness, Sunrise Mountain ISA, Rainbow Gardens ACEC, River Mountains ACEC, and the Lake Mead NRA. Impacts to SDAs from construction and operation of the Proposed Project depend on the location of the crossing as well as the relevant and important values for which SDA was or is being proposed to be designated. Impacts to SDAs by region and alternative are shown in **Tables 2-23** through **2-26**.

### ES.3.16 Transportation

The transportation analysis area includes both the national, state, and local road and railroad transportation network serving the alternative routes, as well as improved and unimproved routes within the local roadway network, railroads, airports, and controlled airspaces. Some portions of the analysis area have extensive local roadway networks (urban and suburban areas), while other portions of the analysis area have few to no local roads (rural and remote areas).

Construction of new access roads would be required in some areas to access structure sites lacking direct access from existing roads, or where topographic conditions prohibit safe overland access to the site on unpaved roads. Road construction may require temporary road closures and/or detours that create access difficulties to public and private property, but adherence to design features and agency BMPs would help to limit and plan for the closures. Project construction would create minor and incidental increases in local traffic, but is not expected to create substantial congestion for extended periods. Construction would add vehicle travel to the roadway network and could introduce travel obstructions on local roads creating potential safety issues. After considering design features, BMPs, and other Project approval requirements, minor and temporary safety issues would be created but no hazardous or unsafe conditions would be created. Increased traffic and travel on roads by heavy vehicles would contribute to local roadway degradation resulting in the

need for additional road maintenance. Overall impacts on road maintenance would be minor in flat and rolling terrain and moderate in steep and mountainous terrain.

Transmission line towers and lines are a navigation issue if they are located too close to airport operations or military airspace operating areas. The Project may create operation and safety issues near airports and may create unresolved conflicts in military airspace operating areas, but incorporation of design features and agency BMPs are expected to lessen the extent of the safety issues to permissible levels. If not, it currently is assumed that any routes with irresolvable issues related to airports or airspace would require additional mitigation to be applied, including the possibility of suggested reroutes. Impacts to transportation by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.17 Social and Economic Resources**

The geographic extent of the social and economic conditions analysis area comprises 23 counties in which one or more of the alternative routes are located and the communities within those counties that are likely to host non-local construction workers associated with the Project. The analysis area is predominately rural, with the exception of the Las Vegas, Nevada, and St. George, Utah, metropolitan areas; however, social conditions and lifestyles in the analysis area vary considerably. All 23 counties in the analysis area gained population during the last decade. There are six Indian Reservations located in the analysis area.

Construction of the two terminals would entail a 27- to 28-month construction period in one location. Average direct construction employment for the Northern and Southern terminals would be 113 and 76 jobs, respectively. Benefits to firms supplying goods and services to the Project (such as contractors involved in construction, and those serving temporary lodging and consumer needs) would include increases in sales, possible new business starts, and hiring additional employees or increased hours worked for existing owners and employees. Approximately 0.7 secondary jobs would be generated in the Rawlins/Carbon County and Las Vegas Valley economies for each direct job associated with the Project. There would be temporary population influxes into the communities near the Northern Terminal, but little Project-related population influx expected in the Las Vegas Valley. Overall demand would be composed of a combination of a few ownership units, conventional single family and apartment rentals, RV/camper parking spots, and motel rooms.

Construction of the transmission line would be completed using three 200-mile "spreads," each with its own work force, fleet of construction equipment, and schedules. Employment would average approximately 140 jobs for each spread. Approximately 0.44 secondary jobs would be generated; however, the widespread nature of the construction activity would result in a dispersal of the temporary effects across multiple communities. Impacts of transmission line construction would be similar in type to those associated with development of the terminals; primary differences stem from the movement of the construction activity along the corridor over time and associated implications for temporary housing and potential demands on emergency response as construction proceeds away from the larger towns and into more rural areas. No high and adverse effects to human health or other environmental resources have been identified as part of this assessment, effectively minimizing the potential for disproportionate affects to low-income populations or members of the potentially affected tribes or reservations. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.18 Human Health and Safety**

Potential health and safety concerns related to power transmission during construction include worker injuries, exposure to hazardous materials, contaminated sites, excessive noise, and risks to workers and the community from accidents. Health and safety concerns associated with operations include electrical shock, electric and magnetic fields, corona, stray and induced voltage, collision hazards, fire risk, and public access to transmission structures and substation equipment.

Project construction would produce noise from heavy equipment needed to build the proposed transmission line routes and electrical substations. Construction noise levels would range from 74 to 88 decibels on the

A-weighted scale (dBA) at 50 feet from any work site. Noise levels temporarily would exceed the USEPA guideline for residential noise (55 dBA) at a distance of about 1,600 feet (USEPA 1974). Design features, BMPs, and mitigation measures would be used to reduce noise levels and limit sensitive receptors exposure during key time periods. Impacts associated with the release or spill of hazardous materials to the environment or people during construction or discovery of contaminated soil or groundwater are expected to be minimal with the implementation of design features. The effects of operation of the Project would involve potential electric and magnetic fields impacts on residences, sensitive receptors, nearby communities, recreation areas, lightning, corona effect on communication sites, stray and induced voltage, noise, fire, and the health and safety of maintenance workers. Through the implementation of design features and the limited number of sensitive receptors adjacent to the reference line, minimal to no impacts to public health are anticipated. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.19 Wild Horses**

There are 10 wild horse herd management areas (HMAs)/herd areas (HAs) located within the analysis area. During periodic wild horse roundups, BLM uses helicopters within the HMAs/HAs to assist in directing the horses into the designated collection areas. Due to the necessary use of helicopters, BLM prefers to locate transmission lines within HMAs/HAs parallel to existing transmission lines when feasible. In general, impacts to wild horses and HMAs would result from noise and increased human activity during installation of the transmission line poles, clearing and grading existing and new access roads, vehicle operation in areas where overland vehicle travel would occur, and use of temporary laydown areas. Construction activities and operation of the transmission line could impact the ability of the BLM to conduct future wild horse gathers in and near the transmission line area. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

### **ES.3.20 Lands with Wilderness Characteristics**

There are 49 units of lands with wilderness characteristics (LWCs) within the analysis area. While all 49 units meet the criteria for LWCs, only 1 LWC unit (Mexican Mountain, within the Price FO) has approved RMP decisions that intend to manage these units as natural areas to protect, preserve, and maintain wilderness characteristics. Eleven units within the Vernal, Moab, and Price FOs were evaluated in an RMP process, but determined to not manage these areas for their wilderness characteristics. The remaining 37 units shown have not been formally evaluated in an RMP process for appropriate management decisions for wilderness characteristics.

Inventory units that are determined to meet criteria for LWC could be intersected or include built portions of the proposed Project and, as a result, some remaining portions may no longer meet the criteria for size (greater than 5,000 acres), naturalness, or solitude. Within Region I, portions of up to 8 LWC units could be eliminated for LWC consideration by the proposed action or its alternatives. Within Region II, portions of up to 8 LWC units could be eliminated for LWC consideration by the proposed action or its alternatives. Within Region III, portions of up to 9 LWC units could be eliminated for LWC consideration by the proposed action or its alternatives. There are no LWC units within Region IV. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

## Abbreviations and Acronyms

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
AC	alternating current
ACEC	area of critical environmental concern
ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AGL	above ground level
AML	appropriate management level
amsl	above mean sea level
Applicant	TransWest Express LLC
AQRV	air quality related value
ATV	all-terrain vehicle
AU	analysis unit
AUM	animal unit month
AWBP	Aransas-Wood Buffalo National Park
AWEA	American Wind Energy Association
BA	biological assessment
BCHA	Bird Habitat Conservation Area
BE	biological evaluation
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BO	biological opinion
CAA	Clean Air Act

CDA	Colorado Department of Agriculture
CDNST	Continental Divide National Scenic Trail
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMP	Comprehensive Management Plan
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
COM Plan	Construction, Operation, and Maintenance Plan
CPW	Colorado Parks and Wildlife
CTC	centralized traffic control
CWA	Clean Water Act
CWMU	cooperative wildlife management unit
DC	direct current
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DRUA	Dispersed Use Recreation Area
dv	deciview
ECM	Environmental Compliance Monitors
EDRR	Early Detection Rapid Response
EHV	extra-high voltage
EIS	environmental impact statement
EMF	electric and magnetic field

ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FLM	Federal Land Manager
FLPMA	Federal Land Policy and Management Act of 1976
FO	field office
<i>FR</i>	Federal Register
<b>g</b>	gravity
GHG	greenhouse gas
GIS	geographic information system
GSM	General Soil Map
GWh/yr	gigawatt hours per year
HA	herd area
HAP	hazardous air pollutant
HMA	herd management area
Hoover Act	Hoover Power Plant Act of 1984
HUC	Hydrographic Unit Code
I-15	Interstate 15
I-70	Interstate 70
I-80	Interstate 80
IBA	Important Bird Area
ID	Interdisciplinary
IM	Instruction Memoranda
IPCC	Intergovernmental Panel on Climate Change
IPP	Intermountain Power Project



IR	Impaired Waters Assessment Report
IRA	inventoried roadless area
ISA	Instant Study Area
km	kilometer
KOP	key observation point
kV	kilovolt
kWh	kilowatt-hour
LADWP	Los Angeles Department of Water and Power
LATN	Low Altitude Tactical Navigation
LCCRDA	Lincoln County Conservation, Recreation, and Development Act
LRMP	Land Resource Management Plan
LRP	limited revegetation potential
LWC	Lands with Wilderness Characteristics
MBTA	Migratory Bird Treaty Act
MFP	management framework plan
MgCl <sub>2</sub>	magnesium chloride
MIS	management indicator species
MLRA	Major Land Resource Area
MOA	Military Operations Areas
MOU	Memorandum of Understanding
MTR	military training route
Mw	moment magnitude
MW	megawatt
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NCA	National Conservation Area
NDOT	Nevada Department of Transportation

NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NFMA	National Forest Management Act
NFS	National Forest System
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNL	National Natural Landmark
NOAA	National Oceanographic and Atmospheric Administration
NO <sub>2</sub>	nitrogen dioxide
NOI	Notice of Intent
NO <sub>x</sub>	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recreation Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NST	National Scenic Trail
NTTG	Northern Tier Transmission Group
NTTR	Nevada Test and Training Range
NVUM	national visitor use monitoring
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic River System
OHV	off-highway vehicle

ORV	off-road vehicle
PA	Programmatic Agreement
PDTR	Project Description Technical Report
PFYC	Potential Fossil Yield Classification
PGA	peak ground acceleration
P.L.	Public Law
PM	particulate matter
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter of 2.5 microns or less
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of 10 microns or less
POD	Plan of Development
Project	TransWest Express Transmission Project
ppb	parts per billion
ppm	parts per million
ppmw	parts per million by weight
RA	Recreation Area
Recovery Act	American Recovery and Reinvestment Act of 2009
RFFA	reasonably foreseeable future action
RHA	Rivers and Harbors Act
RMP	Resource Management Plan
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RPPR	Regional Project Planning Review
RRTT	Rapid Response Team for Transmission
SAR	Small Arms Range
SCD	soil conservation district
SDA	special designation area

SEO	State Engineer's Office
SEZ	Solar Energy Zones
SHPO	State Historic Preservation Office
SIO	Scenic Integrity Objective
SIP	State Implementation Plan
SMA	special management area
SO <sub>2</sub>	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SRMA	special recreation management area
STATSGO	State Soil Geographic
STS	Southern Transmission Systems
SSURGO	Soil Survey Geographic
SWA	state wildlife area
TAC	The Anschutz Corporation
TCP	traditional cultural property
TDS	total dissolved solid
TERP	Terminal Instrument Procedures
TIP	Transmission Infrastructure Program
TMDL	total maximum daily load
TransWest	TransWest Express LLC
TSP	total suspended particulate
TWE	TransWest Express
VRI	Visual Resource Inventory
VRM	Visual Resource Management
VQO	Visual Quality Objective
UDOGM	Utah Division of Oil, Gas, and Mining
UDOT	Utah Department of Transportation

UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
URMCC	Utah Reclamation Mitigation and Conservation Commission
URUD	unroaded/undeveloped
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
UTTR	Utah Test and Training Range
WBD	Water Boundary Dataset
WDOT	Wyoming Department of Transportation
Western	Western Area Power Administration
WECC	Western Electricity Coordinating Council
WGFD	Wyoming Game and Fish Department
WHMA	Wildlife Habitat Management Area
WRCC	Western Region Climate Center
WSA	wilderness study area
WSR	Wild and Scenic Rivers
WUS	Waters of the U.S.
WVEC	West-wide Energy Corridor

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